(No Model.) 2 Sheets—Sheet 1.

H. C. HOFFMEISTER.

STEAM BOILER.

No. 312,718. Patented Feb. 24, 1885.

Fig. 1.

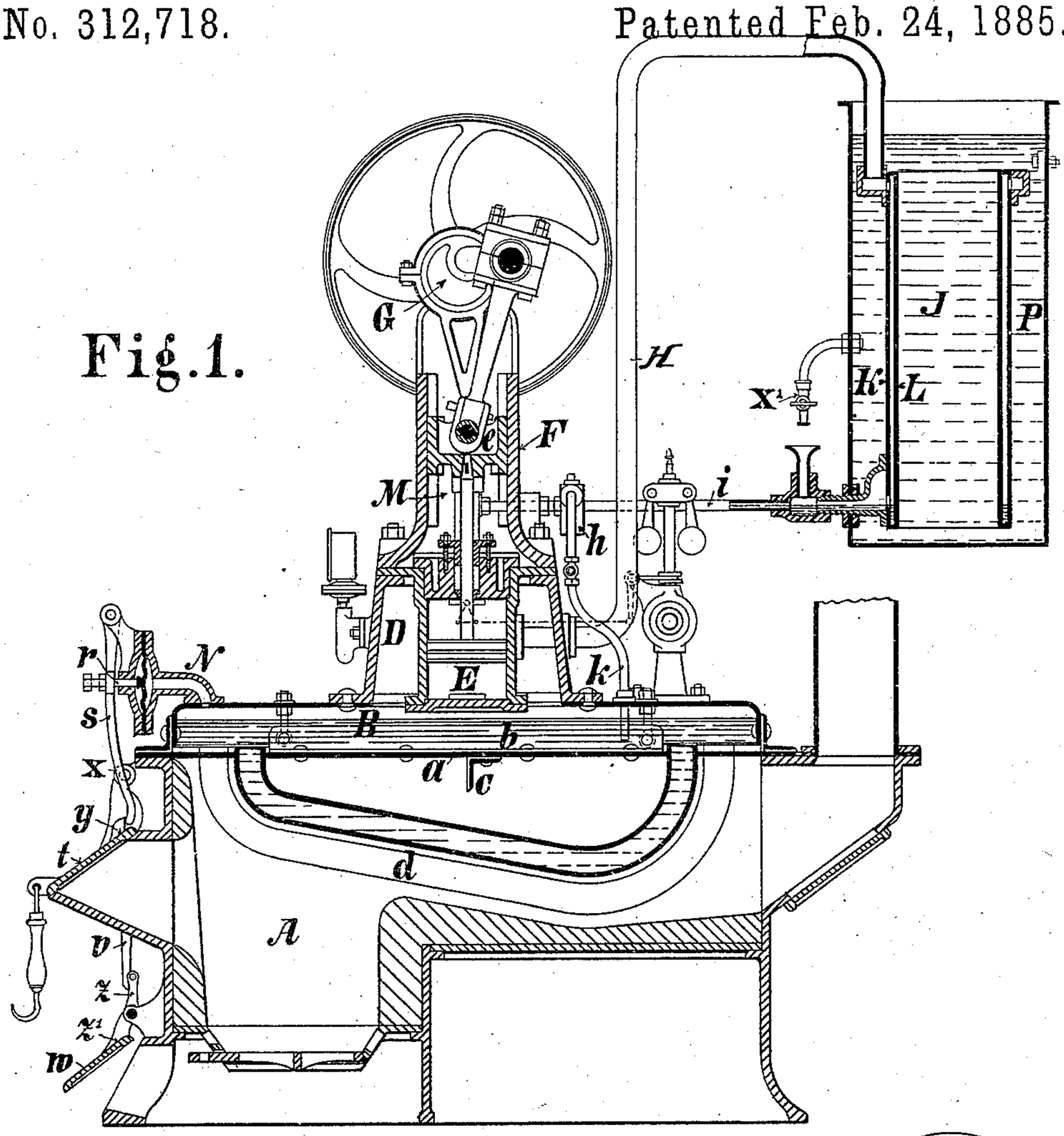
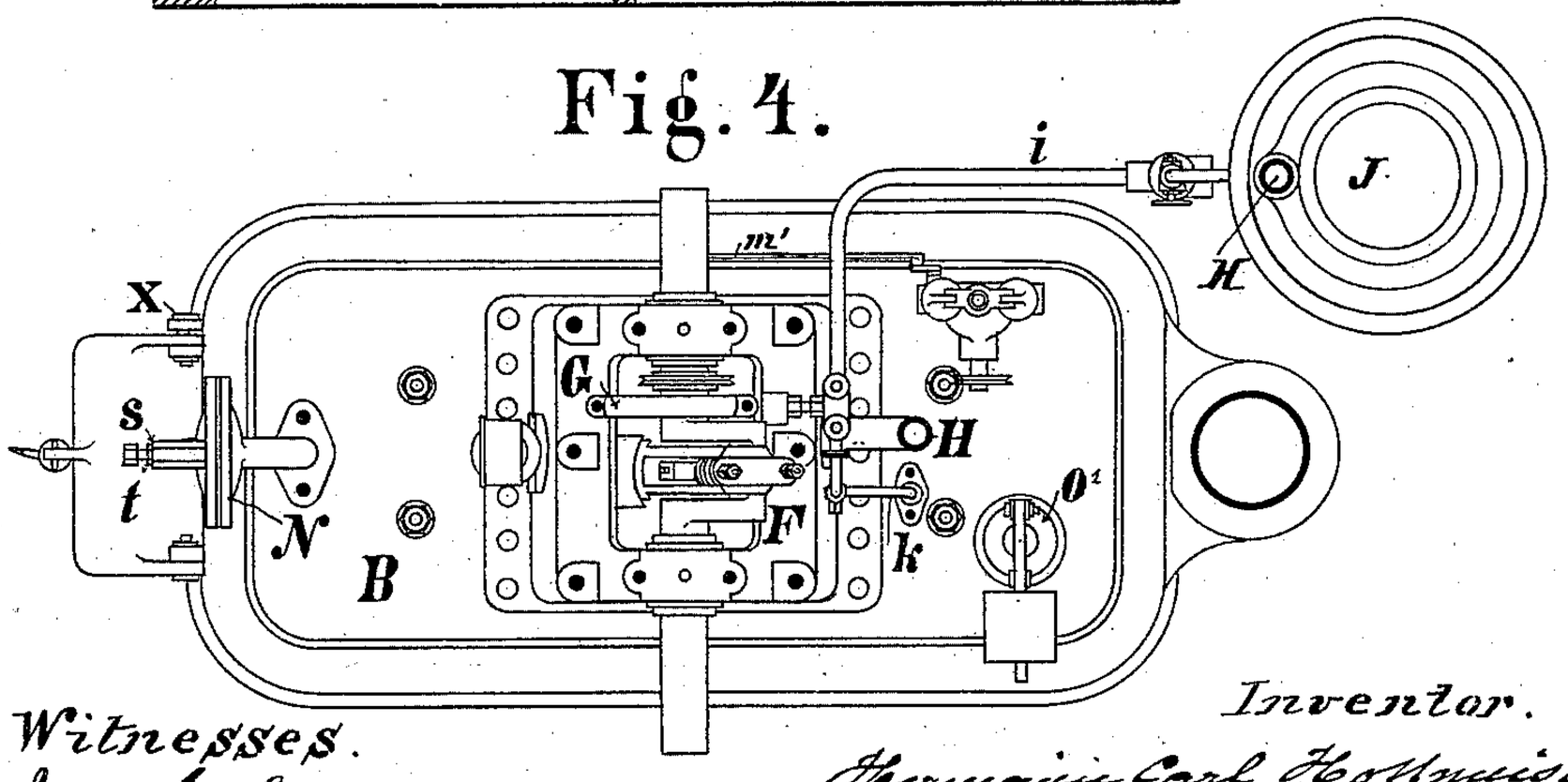


Fig. 4.



Witnesses.
Jacob Kotlowsky.
August Pauls

Inventor.
Hermann Carl Hoffmeister
per Henry E. Raeder
attorney.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

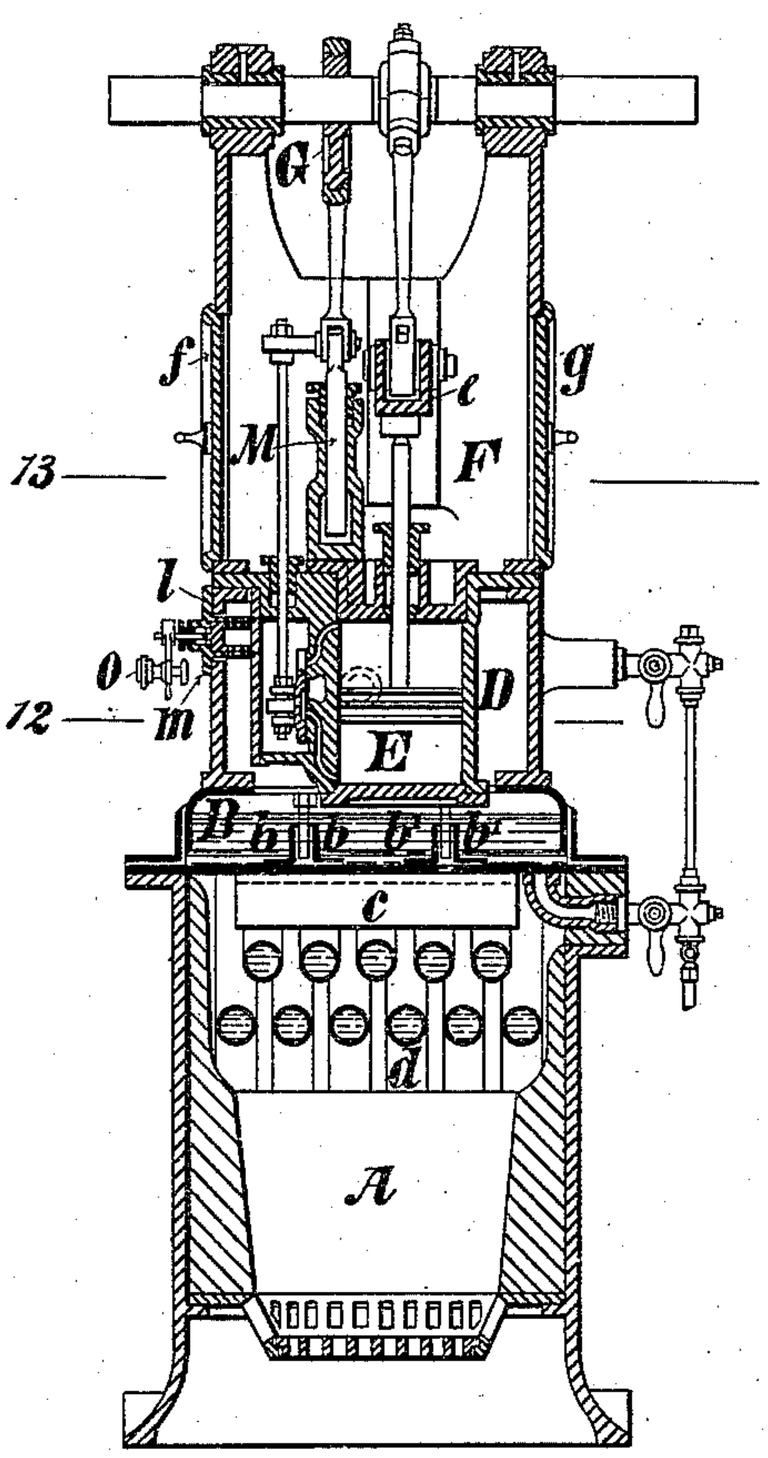
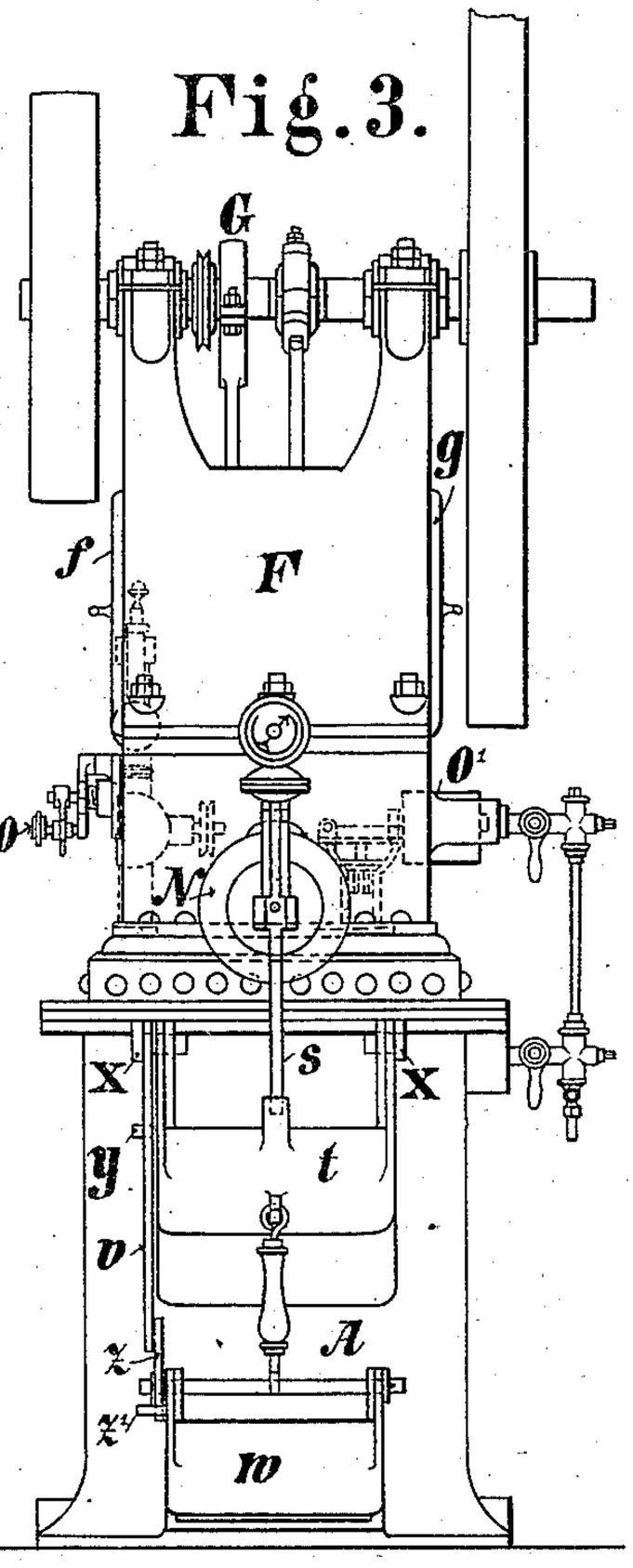


Fig. 3.



Witnesses.
Jacob Kotlowsky
August Paul

Inventor.
Hermann Carl Hoffmeister
per Henry E. Roeder
Attorney.

UNITED STATES PATENT OFFICE.

HERMANN CARL HOFFMEISTER, OF MEIDLING, NEAR VIENNA, AUSTRIA-HUNGARY.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 312,718, dated February 24, 1885.

Application filed April 5, 1884. (No model.) Patented in Germany March 1, 1882, No. 19,874; in France March 9, 1882, No. 147,804; in Belgium March 9, 1882, No. 57,303; in Italy April 12, 1882, XVI, 14,103; XVIII, 110; in England April 26, 1882, No. 1,968, and in Spain March 7, 1883, No. 3,342/3 428.

To all whom it may concern:

Be it known that I, HERMANN CARL HOFFMEISTER, a subject of the Emperor of Austria, residing in Meidling, near Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

This invention relates to an improved boiler of novel construction. The boiler consists, essentially, of a horizontal flat upper chamber, to the lower flat surface of which are riveted or otherwise attached the ends of a sufficient number of curved tubes, which hang down into the fire beneath the boiler, their front ends being attached to the bottom plate and descending vertically for a sufficient distance, and then curving back and up until their back ends are similarly attached to the other end of the bottom plate. The tubes may be arranged so that some of their number descend to a greater depth than the remainder. The plates forming the top and bottom of the flat chamber are riveted or otherwise attached sufficiently strongly together, the space between them being stayed by angle-iron and other stays. The furnace below the flat chamber described, and surrounding the tubes, is preferably of cast-iron lined with fire-brick, in which coal or other suitable fuel is burned. A chimney is provided at one end of the furnace, and at the other end is arranged an inclined hinged door, through which the fuel is supplied, and by which the supply of air to the furnace is automatically regulated, as required, in the following manner:

To the upper plate of the flat chamber described is bolted or otherwise fixed a tube or attachment having a wide-mouthed flange, upon which is fixed, by means of a corresponding external flange, a corrugated flexible elastic diaphragm, preferably of steel or other sufficiently strong thin metal, which will therefore be bent or bulged outward to an extent varying with the varying pressure of the steam behind it. This movement of the diaphragm is transmitted to a central pin, which presses upon a lever suspended to a fulcrum above, the lower end of which lever operates upon the inclined hinged door above described, opening it and admitting air to an extent dependent upon the pressure of the steam against the diaphragm, as described. Below the fire-place is arranged an ash-pit, also closed by a hinged door, which is connected to the inclined hinged fire-door just described by levers in such manner that in proportion as the fire-door is closed the ash-pit door is opened, and vice versa.

Upon the upper surface of the flat generating-chamber first described is bolted a hollow dome or pedestal, preferably of cast-iron, upon which is fitted or fixed a vertical hollow standard carrying the necessary bearings for the fly-wheel shaft, slide-bars, and other ordinary parts of a steam-engine, the cylinder of which is bolted by its upper flange to the top of the dome or pedestal, into which its lower part descends, so as to be surrounded with steam. The hollow standard is provided with doors or covers, by which access is obtained to the guides and other moving parts of the engine. The level of the water in the boiler remains constant, and incrustation is impossible, distilled water only being used. The boiler is supplied in the first place through a safety-valve fixed upon its upper surface.

The accompanying drawings are an illustration of the invention.

Figure 1 represents a longitudinal section; Fig. 2, a cross-section; Fig. 3, a front view, and Fig. 4 a plan of the entire apparatus.

The boiler B belongs to the class of multitubular inexplosible boilers. The main part of this boiler is flat, and consists of the flat hood B, surrounded by an angle-iron, which is rigidly bolted to the entirely flat bottom *a*.

The furnace A is, as shown, of cast-iron, and its fire-box is fitted with a fire-clay lining, the tubes *d* curved in the peculiar form shown, and hang down into the fire beneath the boiler, their front ends being attached to the bottom plate, *a*, and descending vertically for a sufficient distance, and then curve back and up until their back ends are similarly secured to the bottom plate, *a*, which is strengthened by the angle-irons *c b b'*.

To the angle-irons *b b'* suitable stays are secured, the upper ends of which are attached to the top plate of the hood B, and the angle-iron *c* is attached to the under side of the flat

bottom plate, *a*, at right angle to the angle-irons *b b'*, thus preventing the bulging of the top of the hood B and the flat bottom plate, *a*, of the boiler.

The heating may be effected by any suitable fuel.

The intensity of the combustion is regulated by the door *t*, which is adjusted automatically to admit air as required.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a steam-generator, the combination of the flat hood B, with its surrounding angle-iron bolted to an entirely flat bottom plate, *a*, provided with angle-irons *b b'*, having suitable stays attached to the top of the hood B, the angle-iron *c*, attached at right angle to the angle-irons *b b'*, for strengthening the flat boiler, and the descending tubes *d*, substantially as and for the purpose described.

HERMANN CARL HOFFMEISTER.

In presence of—

JAMES RILEY WEAVER,
CLARENCE M. HYDE.